3.2 WATER

This section discusses water-related issues associated with the proposed action. It is based primarily on the Preliminary Storm Drainage Report prepared by Rosewater Engineering, Inc., in December 2001, which is included as **Appendix B,** and on the Final EIS for the Sand Point Reuse Project (City of Seattle, 1996). **Appendix B** lists a slightly smaller project area (144 acres) for the proposed action, due primarily to the late addition to scope of the enlarged NE 65th Street corridor and the engagement of the existing entry wetland. These areas added to the drainage consultant's scope were included and calculated as part of the drainage report, but are identified as "offsite basins" contributing to the site, and represent no change to the assessments and conclusions of the drainage report. Quantities reported in **Section 3.2** reflect the enlarged 153-acre area of the proposed action.

3.2.1 <u>Affected Environment</u>

3.2.1.1 Hydrology/Runoff Patterns

The project site is located within the Cedar/Sammamish water resource inventory area of Washington state, specifically within the Lake Washington drainage basin. There are no perennial streams on the project site or within Sand Point Magnuson Park, and Lake Washington is the only perennial open water body within or adjacent to the project site. Historical construction activities associated with naval station development included routing small streams through culverts and filling wetland areas. Stormwater runoff on the project site currently drains, primarily by sheet flow, toward the lake. An unknown portion of the runoff is collected by an existing storm drain system and conveyed toward the lake. A prominent ditch located in the southeasterly portion of the project site collects some of the sheet flow runoff from the project area and conveys it directly, untreated to Lake Washington.

Groundwater under the project site generally moves by sheet flow east toward Lake Washington from a recharge area in the uplands west of the site. The water table lies about 10.5 feet below ground surface. Groundwater in the lower-lying areas of the site flows under artesian conditions. The water moves up through discontinuous areas of the glacial till unit to enter Lake Washington. Surface water filtering through the fill material seasonally becomes trapped on top of the till unit in low areas.

The average ground slope for the project site is roughly 0.7 percent. Of the 153.3 acres of project area, roughly 26.3 acres are impervious surfaces and 127 acres are meadow, landscaping (including scrub-shrub and trees), or fields. The impervious area includes vehicular pavement (parking lots and roadways), paved paths, gravel, paved tennis courts, and isolated buildings. The remaining (pervious) area of the site (meadow, landscaping, and fields) is often saturated in wet weather because the site is relatively flat and the ground is compacted from prior construction and demolition activities. As a result, perched slow moving stormwater runoff saturates the pervious surface on the site. Isolated wetlands and local depressions also exist in several locations.

The existing storm drainage systems on the Sand Point site have deteriorated over time and in several areas appear to no longer be functioning as designed or constructed. The storm drains convey both on- and off-site stormwater runoff through the project site. Storm drains vary in size from 4-inch pipe for subdrainage systems to 30-inch pipe for major site trunk lines. A number of existing storm drain interceptor lines cross through portions of the 153-acre project site, as do two storm drain trunk lines (see Figure DR-6 in **Appendix B**). Stormwater from the Sand Point site discharges to Lake Washington at approximately seven locations along the shoreline of the peninsula. Most of these locations are elsewhere on the peninsula, such as at Pontiac Bay near the northwestern corner of the park, although three drain lines appear to discharge to the lake near the beach area within the general limits of the project site. The existing sports fields were constructed with subdrainage systems that now appear to be inoperable, because the fields are saturated much of the time.

3.2.1.2 Water Quantity

There appear to be no existing stormwater quantity control facilities on site. Stormwater appears to drain directly to Lake Washington without detention, except for the flows that are retained naturally in the wetlands and local depressions. Two specific off-site areas contribute stormwater runoff to the Sand Point Magnuson Park drainage, sports fields/courts and wetland/habitat project site. One is located at NE 65th Street, at the southwest corner of the project, and extends south off the park site and includes roughly 26 acres. This area contributes runoff in a ditch/pipe system in an easterly direction along the southerly edge of NE 65th Street until the flow reaches the project site. The off-site runoff crosses NE 65th Street at this point and enters the storm drain system(s) on the project site.

The other contributing area, roughly 2.4 acres, is within the Sand Point Magnuson Park property, but west of the project site. This area contributes runoff to a trunk storm drain that extends east, across the project site, directly to Lake Washington near the easterly boat launch area.

There is an additional source of off-site water supply to the project site. The USGS fisheries research property south of NE 65th Street supplies "clean" water to the project site on a continuous basis. As part of the fish research operation, the USGS pumps water from Lake Washington to the facility, circulates the water through on-site systems, and then releases water at 0.9 cubic feet per second (cfs) to the project site through a discharge pipe. The 0.9 cfs discharge rate represents a monthly runoff volume of 53.5 acre feet. This water supply is continuous and is expected to be maintained as long as the USGS facility is in operation.

Stormwater runoff volumes for the site were calculated using the King County Wetpool Facilities Design Method, based on actual precipitation data recorded for the site by the Western Regional Climate Center (2001) administered by NOAA. Annual precipitation for the site averages approximately 35 inches. Monthly rainfall peaks in January, with average precipitation 0f 5.4 inches for the month. Existing monthly runoff volumes calculated for the project site, including the USGS water supply, vary from roughly 55.7 acre-feet per month in summer (August) to roughly 88.4 acre-feet per month in winter (November). Excluding the USGS water supply, the monthly runoff volumes are 2.2 acre-feet in August and 34.9 acre-feet in November.

3.2.1.3 Water Quality

Because there are no perennial streams or open water bodies on the project site or elsewhere in Sand Point Magnuson Park, water quality data specific to the project site are limited. DPR Sand Point Magnuson Park Division staff have not observed evidence of poor water quality at the site and have not been notified by other parties of any suspected water quality problems. Water quality samples were taken in areas around the Off-Leash Area of the park (to the north of the project site) and in selected puddles adjacent to the project site in the winter of 2000. Elevated levels of bacteria were found in these samples when they were analyzed in a laboratory. The analysis determined the bacteria were related to the animal and bird population residing in the park, and therefore were expected natural occurrences in small. isolated puddles in the park.

There appear to be no existing, constructed water quality treatment facilities for stormwater on the site; runoff that is collected by the existing storm drain system appears to be conveyed to Lake Washington without treatment. Some degree of natural treatment occurs as a result of sheet flows passing over existing pervious surfaces and from settlement that occurs in the existing wetlands or local depressions.

The waters of Lake Washington are categorized by regulation as Class AA under the State water quality standards (WAC 173-201A-120). The lake was listed in 1998 by the Washington Department of Ecology (WDOE, 2000) under Section 303(d) of the Clean Water Act as having impaired water quality, because of levels of fecal coliform bacteria measured at several locations.

3.2.2 Environmental Impacts of the Proposed Action

3.2.2.1 Hydrology/Runoff Patterns

Post-construction drainage systems and features for the proposed action are shown on Figure DR-7 in **Appendix B.** Runoff flows from and through the site would include sheet flow, shallow flow and channel flow characteristics. The site stormwater runoff would be conveyed to Lake Washington through drainage "chains" that include several different drainage systems. These systems include vertically draining fields with subdrainage systems, swales and ditches, pipes and culverts, and wetlands and ponds.

Some of the existing pavement on the 153.3-acre project site would be removed as part of the project. The post-developed project site would include roughly 18.6 acres of impervious surface constructed hardscape, i.e., parking lot, roadway and pathway pavements and buildings. This represents a net reduction of 7.7 acres from the existing condition.

Total impervious surface area would increase under the proposed action, because open water is also considered an impervious surface for hydrologic modeling purposes. The post-developed project site would include roughly 11.5 acres of open water during the summer (dry) months and 16.5 acres of open water including the lagoon during the winter (wet) months. Although the total impervious surface area would increase significantly, with the open water surface included, there are no "downstream" constraints or potential streambank erosion concerns related to the additional impervious surface area.

3.2.2.2 Water Quantity

Stormwater quantity control is not required for the proposed action because the site drains directly to Lake Washington, a "receiving water body" of the State of Washington. However, post-development peak flows would be reduced from the existing conditions because of the hydrologic characteristics of the proposed action. The stormwater peak flow reduction with the project would be due primarily to the large area of athletic fields. The fields would drain vertically, and ultimately horizontally, through sand and gravel field subgrade sections. This would result in a slower rate of runoff discharge, compared to impervious surfaces or compacted soils.

Although the proposed action includes construction of multiple wetland ponds, these ponds would not provide stormwater quantity control and are not considered detention ponds. The ponds would typically be full in the winter and would not have additional storage capacity available during winter precipitation events. The main reason for this is that the ponds are intended to be wetlands that would have minimal surface water elevation fluctuations during the winter (wet) months. Therefore, the ponds are designed as flow-through facilities, with water coming into the ponds equal to the flow out of the ponds, during the winter months to maintain constant water surface elevations.

3.2.2.3 Water Quality

Construction of the proposed action would create the potential for temporary water quality impacts to surface water, because the surface of much of the project site would be disturbed by project clearing and grading activities. Areas of disturbed soil would be exposed to precipitation, and sediment and other constituents could be transported from the site in stormwater runoff. Levels of suspended solids and turbidity in surface water draining from the project site could be temporarily elevated as a result.

The construction contractor would need to obtain a construction stormwater permit from Ecology under the National Pollutant Discharge Elimination System (NPDES). The construction stormwater permit would require the use of temporary erosion and sediment control (TESC) measures to protect disturbed areas, control and direct stormwater runoff from and through construction zones, and provide water quality treatment for runoff from the site. TESC measures would include ground stabilization, interceptor swales, sediment ponds and traps, fabric filter fencing and other applicable measures identified in the City of Seattle's *Construction Stormwater Control Technical Requirements Manual.* TESC treatment options are illustrated in Figures DR-15 through DR-17 in **Appendix B.** With the required use of TESC measures, the discharge of pollutants to surface water during construction would be limited and potential water quality impacts would be insignificant.

The proposed action would include several different systems and facilities to provide long-term water quality treatment for the completed project. These systems include biofiltration swales, filter strips, wetponds, and water quality vaults (with and without specific targeted treatment for specific targeted pollutants). Inclusion of different types of treatment facilities in the plan will provide an opportunity to compare performance of treatment facilities, shortly after installation and construction and after years of maintenance.

The natural-turf athletic fields would provide filtration of rainfall that lands on the field and flows through the sand/gravel field bases, similar to a sand filter. Stormwater would drain vertically through the field top- and base-course layers and would migrate to the subdrainage pipe system. The sub-base material under these fields would provide filtration treatment of chemical constituents in the drainage water, which would include fertilizers and other chemicals applied to the natural-turf fields during normal maintenance. Test data indicate that the quality of water draining from the natural-turf sports fields would meet U.S. EPA guidelines for drinking water quality. Although the synthetic-turf athletic fields would also provide water quality treatment through the same filtration process, water quality treatment would not be required for those surfaces because the field materials are inert and would not be fertilized. However, these field drainage systems would provide treatment for pollutants from the air that are attached to precipitation.

The existing storm drainage systems on the site are deteriorated and in some cases inoperable. It is assumed that the existing storm drain systems would either be abandoned or removed during construction of the proposed action. The proposed storm drainage facilities would greatly improve the conveyance and treatment of stormwater leaving the project area.

An important component of the proposed action is the system of wetlands on the site (see **Section 2.2.5** for a complete description of the proposed wetland types). The types of ponds would range from "paddies," an area of concentrated shallow localized depressions (generally in the western part of the site) that would fill up during early winter months and operate as flow-through ponds during the remainder of the winter, to continuous all-season ponds that would contain water throughout the year. The ponds designed for water quality treatment are ponds that would receive "untreated" or "partially treated" runoff from impervious surfaces. Stormwater runoff from impervious paved surfaces would receive water quality treatment before leaving the site and entering Lake Washington. The proposed water quality measures include biofiltration swales/ditches, filter strips, wetponds, and water quality vaults. These facilities would be designed consistent with the applicable standards established by Ecology, King County and the City of Seattle, which are based on attaining a specified water quality treatment level for a given type of treatment facility (typically removal of from 50 to 80 percent of a particular type of pollutant from the runoff stream through the facility). Based on the number and design of water quality facilities included in the project design, it is anticipated that the required water quality treatment goals would be met. Consequently, a positive water quality impact on the area is expected as a result of the proposed action, because runoff from the site is currently untreated.

3.2.3 Impacts of the Alternatives

3.2.3.1 Lesser-Capacity Alternative

Limited potential for short-term erosion and sedimentation impacts to water quality might occur during construction of the lesser-capacity alternative, as described in **Section 3.2.2.3** for the proposed action. The potential for these construction effects would be slightly reduced, because 5 to 10 acres in the interior of the site would not be disturbed for construction under this alternative.

Under the lesser-capacity alternative, stormwater runoff would also be conveyed to Lake Washington through drainage "chains" that include several different drainage systems. Although the lesser-capacity alternative incorporates considerable differences in athletic field surfaces and minor differences in the extent of wetland area, it still would result in an integrated drainage system on the site and an improvement over existing drainage conditions. Impacts to runoff patterns and stormwater quantity control would be similar to those described for the proposed action. The overall stormwater peak flows would be reduced, compared to existing conditions, due to improved subdrainage systems beneath the sports fields.

No significant short- or long-term impacts on water quality are expected. The extent of natural-turf sports fields would be 26.2 acres in this case, compared to 15 acres for the proposed action and 21.6 acres under existing conditions. While these fields would receive periodic applications of fertilizers and other chemicals for field maintenance, test data indicate the stormwater draining from the fields would meet water quality guidelines because of the filtration provided by the sub-base materials. Installing new stormwater quality treatment facilities, when none presently exist, would result in an additional level of water quality improvement.

3.2.3.2 No Action Alternative

Normal maintenance activities and demolition of a few existing structures on the project site are associated with this alternative. These activities involve minimal potential for significant water quality impacts. Over the long term, stormwater from the project site and adjacent contributing areas would continue to drain into Lake Washington with no water quality treatment.

3.2.4 Cumulative Impacts

Construction of the proposed action would not be likely to result in significant cumulative water quality impacts. Based on the analysis presented in **Section 3.2.2**, any adverse water quality impacts from the project itself would be short-term and would likely be insignificant. Other pending and planned projects at Sand Point Magnuson Park would be located elsewhere on the property, would not involve extensive areas of ground disturbance, and would be subject to the same types of control measures. Construction of a new medical support office on the west side of Sand Point Way has disturbed a small surface area, and will be nearly completed when the proposed action would begin construction.

Stormwater drainage from the project site would not likely have the potential for cumulative long-term adverse water quantity or quality impacts. The project site does not drain to downstream conveyance systems but directly to Lake Washington. Stormwater runoff from impervious surfaces in the project area would be collected and treated prior to release through the wetland complex to Lake Washington. The net result would likely represent a water quality improvement for the area, because stormwater runoff draining from and through the project site currently receives no water quality treatment. In addition, the project would create up to 16.5 acres of open water surface area in the winter months, a significant increase from existing conditions. These two features of the completed project would offset some of the adverse impacts (e.g., increased runoff from impervious surfaces, and loss of open surface water bodies) resulting from development on the Sand Point peninsula and in the surrounding area that have accumulated over time.

3.2.5 Mitigation Measures

Temporary erosion and sediment control (TESC) measures would be incorporated into project construction activities, per the City of Seattle (2000a) *Construction Stormwater Control Technical Requirements Manual*, to mitigate potential short-term impacts to water quality during the construction phase of the project. These measures were described previously in **Section 3.1.5**.

A variety of water quality treatment facilities or features are incorporated into the project design to supply clean surface water drainage to the wetland/habitat complex, as described in **Section 2.2.4**. These features include bioswales, filtration strips, water quality ponds and water quality vaults. The locations of these facilities are indicated in Figure DR-7 in **Appendix B**. Potential water quality monitoring stations are also identified on this figure, as monitoring of water quality throughout the construction period and during long-term operation would be a key component of the project.

Operation and maintenance plans and manuals for the drainage system, sports fields and the wetland/habitat complex would be developed at some time in the future, probably in conjunction with further design development and production of Construction documents for each of the successive phases, with the earlier phases setting a precedent for operation and maintenance of later phases These plans and manuals would address applicable and available measures to promote water quality, water conservation waste reduction and water reuse in the operation and maintenance of project resources.

3.2.6 Significant Unavoidable Adverse Impacts

Clearing and grading activities for the proposed action could produce short-term increases in suspended solids and turbidity levels which could result in temporary water quality impacts. However, the use of required Temporary Erosion and Sediment Control measures would limit such impacts in duration, intensity and extent, and they are not expected to be significant. Any long-term effects of the project on water quantity and quality would likely be positive.